

## EDITORIAL

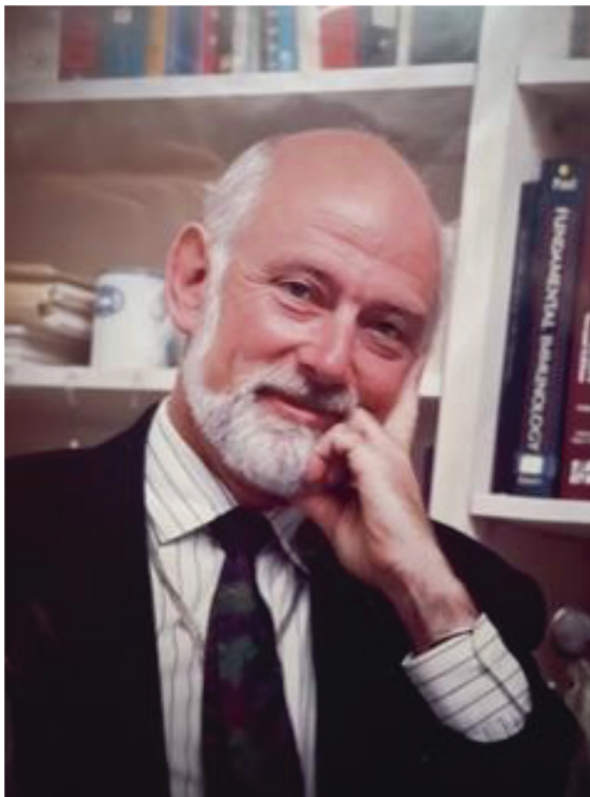


# John Bienenstock Obituary

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On the 25th of July, disheartening news of the untimely demise of our distinguished colleague and dear friend, John Bienenstock, reached the immunological community and was profoundly felt by mucosal immunologists. Undoubtedly, Dr. Bienenstock is one of the universally acknowledged founders of the discipline of mucosal immunology, together with several current colleagues and the recently deceased Drs. Per Brandtzaeg and Lars Å Hanson.



Recognition of the mucosal immune system as an integral, and perhaps the dominant component, of the entire immune system is based on quantitative studies of B and T cells as well as antibody-producing cells in mucosal lymphoid tissues. In the mid 1960's, John Bienenstock, burst into the immunological scene as a mucosal immunologist with a series of groundbreaking studies that convincingly demonstrated the integral interactions of individual components of the mucosal immune system and defined the latter's inductive and effector sites. This culminated a decade later (1974) in a foundational study of mucosal immunity in which Dr. Bienenstock showed that cells in bronchial lymphoid aggregations (BALT) could function in a similar manner to cells in

Peyer's patch lymphoid aggregations (GALT) in their ability to repopulate other parts of the mucosal immune system. Thus, for the first time Bienenstock (and ultimately the rest of the immunologic community) could envision a Common Mucosal Immune System (so-named by Bienenstock) that was both a unique and vital part of the immune system as a whole. Even today, almost half a century later, this work is remembered (and cited) in our attempt to understand the immunopathology of the SARS-CoV-2 infection, an infection that initially invades the upper respiratory tract and lung tissue but can spread via routes defined by the migration of cells in the mucosal immune system.

However, John Bienenstock's contributions to mucosal immunology didn't stop there. In the ensuing years he and the groups of investigators he led continued to provide impressive studies establishing the structure and production of polymeric secretory IgA, the definition of inductive and effector mucosal sites and their associated histological features, the presence of distinct phenotypes of cells in mucosal compartments, and the induction of immune responses ensuing after a variety of immunization routes. In addition, in recent years the broad yet deep knowledge of mucosal immunity this work encompasses allowed him to pursue difficult questions concerning the neurological regulation of the mucosal immune system and the impact of mucosal microbiota on the mucosal system. Overall, the continued excellence of the research embodied in these studies led to his well-deserved designation as one of the most brilliant and impactful scientists in the field of mucosal immunology.

Those of us who were privileged to know John as a close, personal friend will remember his unforgettable charm as well as his witty, entertaining and generous cast of mind. At numerous meetings, he displayed not only an impressive knowledge of immunology but also a deep understanding of a broad spectrum of scientific and cultural conundrums. John's astute intellect generated a continuous stream of insightful questions and solutions as well. For this reason among others, he was an indispensable member of the early and relatively small group of mucosal immunologists establishing the field of study.

John's conception of scientific life extended beyond the actual performance of science. This took the form of his prominent role in the organization of many national and international conferences, including those in Canada, the United States, and many European countries. Some of these meetings were sponsored by the Mucosal Immunity Society, and John was in fact an early organizer of the Society and its second President. In addition, he was the co-editor of the "Proceeding of International Meetings of Mucosal Immunologists" published in the *Advances of Experimental Medicine and Biology*, and more importantly, the co-editor of first two editions of *Mucosal Immunology* book published by Academic Press/Elsevier. All the while he was the sponsor and advisor to countless graduate students, post-doctoral fellows, and national and international visitors who worked in his laboratory.

John was born in Hungary but his family immigrated to England in the late 1930's and John received his college and medical education in that country. After initial scientific training as a post-

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doctoral Fellow at Harvard, he began his lifelong career as a mucosal immunologist by working at the University of Buffalo under the guidance of Thomas Tomasi, the “father” of mucosal immunology. Then, having already established himself as a leader in mucosal immunology, he moved to MacMaster University where planted his feet and stayed on as one of the intellectual and administrative leaders of this major Canadian educational institution. Among the positions he held at MacMaster was Distinguished University Professor of Pathology and Molecular Medicine, Chair of Pathology and Vice president and Dean of the Faculty of Health Sciences. In addition, in a related position he has recently served as Director of the Brain and Body Institute at St. Joseph’s Health Care in Hamilton, Canada. John’s productive career and excellence was recognized by many awards including an Honorary Degree of Doctor of Medicine, Goteborg University, Sweden, the MacMaster Community Distinction Award, election to the Canadian Medical Hall of Fame, the Order of Canada from the Canadian government, the designation as a Distinguished University Professor at MacMaster University, and the designation as Distinction as the Fellow of the Royal Society of Canada.

John is survived by his wife for over 60 years, Dr. Audrey (Dody) Sanders, herself a remarkable scholar and physician who served as the president of the Royal College of Physicians and Surgeons of Canada. In addition to his exceptional scholarly achievements, we

will remember John as a kind, caring, and generous friend who brought pleasure and inspiration to all of us. We shall miss him greatly.

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#### COMPETING INTERESTS

The authors declare no competing interests.

#### ADDITIONAL INFORMATION

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